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ANESTHESIA

**POSITIONING
OF THE PATIENT
POSOPERATIVE CARE**

laparoscopic cholecystectomy FVC is reduced by approximately 30% and is normal at 24 h postoperatively.

- Reduced post operative ileus.
- Earlier mobilization.
- Shorter hospital stay which resulting in reduction overall medical cost.

The following monitoring device should be routinely used at laparoscopic surgery:

3.2.1: Electrocardiogram



Sphygmomanometer
Airway pressure monitor
Pulse-oximeter

Anesthesia for laparoscopic surgery

Anesthetic management for patients undergoing laparoscopic surgery must accommodate surgical requirements and allow for physiological changes during surgery. Monitoring devices are available for early detection of complications the possibility of the procedure being converted to open laparotomy needs to be considered



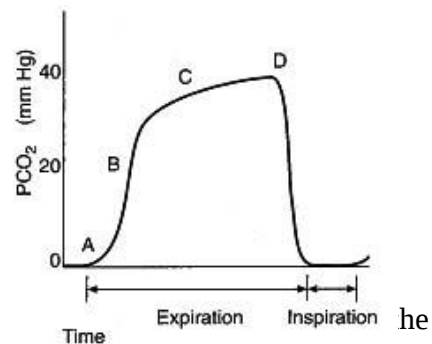
Compared to laparotomy the major advantages are:

- Reduced tissue trauma required for surgical exposure so better cosmetic.
- Reduced wound size and post operative pain
- Improved post operative respiratory function: following open cholecystectomy FVC is

Reduced by approximately 50% and changes are still evident up to 72 h postoperatively. Following

system for monitoring the concentration of exhaled CO_2 , consisting of a sensor placed in the breathing circuit or a tube that carries part of the exhaled gases to the analyzing device, a mass spectrometer or an infrared spectrometer, and devices to provide continuous visual (cathode ray tube) and graphic (printer) displays.

Capnogram: a real-time waveform record of the concentration of CO_2 in the respiratory gases.



- B : dead space and alveolar CO_2
- C : alveolar plateau
- D : end-tidal CO_2 tension (PETCO₂)

Peripheral nerve stimulator



Capnography : End tidal CO_2 concentration (PETCO₂) monitor : monitoring of the concentration of exhaled CO_2 in order to assess the physiologic status of patients with acute respiratory problems or who are receiving mechanical ventilation and to determine the adequacy of ventilation in anesthetized patients. Capnograph: a

Anaesthesia.

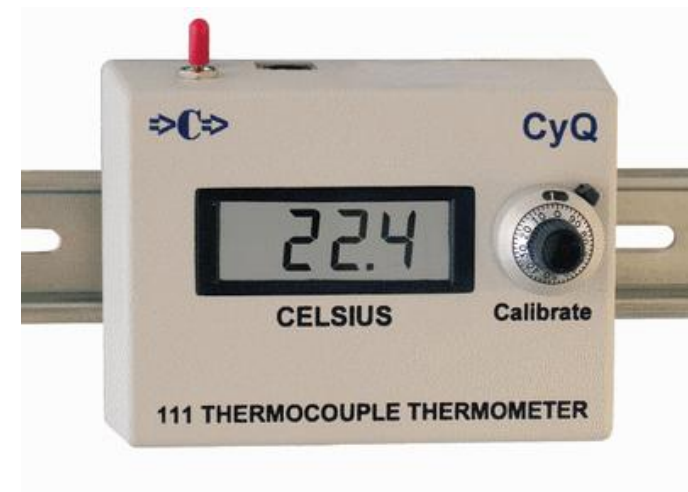
Anaesthesia.



In patient with sever cardiopulmonary compromise
use intra-arterial blood pressure and CVP monitoring.



Body temperature probe



Anaesthesia.

- **Respiratory:**

Diaphragmatic displacement, reduced lung volumes and compliance, increased airway resistance, increased ventilation/perfusion mismatch, hypoxia /hypercapnia from hypoventilation, increased risk of regurgitation.

- **CVS:**

Increased systemic vascular resistance raised mean arterial pressure, compression of inferior vena cava, reduced venous return, reduced cardiac output.

- **Renal:**

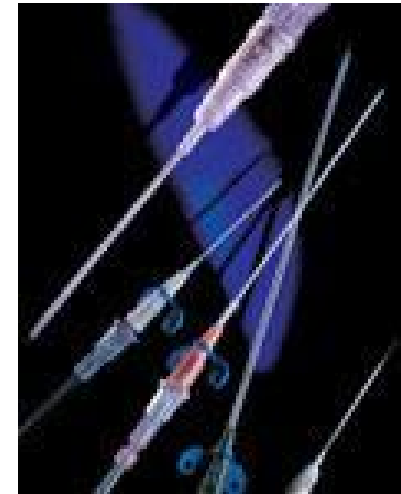
Reduced renal blood flow, reduced glomerular filtration rate, reduced urine output

Patient positioning .with upper abdominal procedures the patient is placed head up position .the usual tilt is 15-20 degrees .some left tilt is usual for cholecystectomy. This posture may further affect CVS.



Systematic carbon dioxide absorption may produce Hypercarbia and acidosis.

Anaesthesia.



Intra-operative effects of laparoscopic surgery:
Pneumoperitoneum raises intra –abdominal pressure. Physiological changes are minimized if intraabdominal pressure <15mmHg. This value should be monitored on the insufflation equipment.



Physiological effects include:

preoperatively and have surgeon experienced in the procedure as the operator. Beware of patients being admitted on the day of surgery without the appropriate preoperative preparation.

Prescribe paracetamol or diclofenac suppository preoperatively for post operative control.

Be prepared to convert to an open procedure (1-3%).

Perioperative

General anaesthesia

Induction: intravenous induction with Propofol or barbiturate followed by intermediate acting non depolarizing muscle relaxant such as vecuronium, atracurium or cisatracurium

Maintenance: with inhalational agent like Isoflurane or with intravenous infusion of Propofol.



Extraperitoneal gas insufflation occurs through a misplaced trocar or when gas under pressure dissects through tissue defects. It may cause subcutaneous emphysema, pneumopericardium, or Pneumothorax. Venous gas embolism may occur when trocar is inadvertently positioned in a vessel. Presents as acute right heart failure, reduce ETCO₂, arrhythmias, myocardial ischaemia, hypotension, elevated CVP. Unintentional injuries to intra- abdominal structure – major vessels, viscera, liver and spleen. May not be detected during surgery but presents postoperatively with pain, hypotension, hypovolaemia, peritonitis, septicaemia.

Anaesthetic management

Preoperative

Contraindications to laparoscopic surgery are relative. Successful laparoscopic procedures have been carried out of patients who were anticoagulated, markedly obese, or pregnant.

Fit and young patients tolerate the physiological changes well.

Elderly patients and those with cardiac or pulmonary diseases have more marked and varied responses.

Caution should be taken in patients who were ASA>3, age>69years, those who had cardiac failure, and those with widespread ischaemic heart diseases.

Patients with marked respiratory or cardiac disease must be thoroughly reviewed and optimized

Anaesthesia.

Some discomfort may also still be felt during laparoscopy in spite of a high block due to stimulation of the vagus nerve from abdominal or intestinal distension.

Post operatively

Pain varies significantly and is worst in the first few hours postoperatively. It ranges from shoulder tip pain (diaphragmatic irritation) to deep seated pain from surgery.

Significant post operative pain extends beyond first day raises the possibility of intra-abdominal problems.

Prescribe regular paracetamol, diclofenac or ketorolac (with spasmolytic in Cholecystectomy) to control post operative pain.

Nausea and vomiting give antiemetics intra operatively or post operatively.

Ten points to be kept in mind at time of laparoscopic surgery

1. All patients undergoing laparoscopy should have an empty bowel. In the unlikely event of bowel damage there is much less risk of contamination if the bowel is empty.
2. Good muscle relaxation reduces the intra abdominal pressure required for adequate working room in abdominal cavity.
3. The inflation of stomach should be avoided during artificial ventilation using mask as this increase the risk of gastric injury during trocar insertion or instrumentation.
4. Tracheal intubation and intermittent positive pressure ventilation should be routinely used.

Anaesthesia.

Nasogastric tube: insert and aspirate. This deflates the stomach reducing the risk of gastric injury during trocar insertion and improves surgical exposure.

Nitrous oxide: Use of nitrous oxide is controversial because it may cause abdominal distension and predispose to nausea and vomiting

Opioids: Short acting opioids e.g. fentanyl, alfentanil can be used intraoperatively to cover what can be an intense but short-lived stimulus.

Fluids: avoid hypovolaemia as this exaggerates the CVS effects of the procedure

At end of operation encourage the surgeon to expel as much CO₂ as possible to reduce pain. Injection of local anesthetic to the wound sites.

Remove the nasogastric tube before taking the patient to recovery.

Local or regional anesthesia

Epidural anesthesia has been used for selected patients successfully for laparoscopy. Unfortunately many patients cannot tolerate the abdominal distention if local anesthesia used alone.

If epidural anesthesia is to be used successfully a relatively high sensory block (T2-T4 levels) is required.

A regional block to this level may impair the muscles of thorax which normally aid respiration, weakness of the respiratory muscles combined with the restrictive effect of Pneumoperitoneum and the absorption of carbon dioxide may result in hypercarbia.

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